

SESSION 1- Upcoming and Proposed Missions (Planetary and Earth Sciences)

PR32-INV4

Scripps-NISTAR–New Instrumentation for a Challenging Mission:
Earth Radiation Budget Measurements from L-1

Steven R. Lorentz (L-1 Standards and Technology, Inc.),

J.P. Rice (National Institute of Standards and Technology),

Francisco P.J. Valero (Scripps Institution of Oceanography, UCSD)

Space-based active cavity radiometers have traditionally been used to monitor solar irradiance, as in the ACRIM series of instruments and the VIRGO instrument on SOHO. They have also been used for Earth radiation budget experiments such as ERBE. Various improvements in radiometry at national standards laboratories such as NIST over the past few decades have opened up the possibility of making accurate total irradiance measurements from weaker sources such as the Earth through filtered channels, with higher accuracy than hitherto possible. The Scripps-NIST Advanced Radiometer (NISTAR) is an electrical-substitution radiometer that will fly aboard the Deep Space Climate Observatory mission. The role of NISTAR is to provide measurements of reflected solar and Earth thermal radiation as viewed from the Lagrange-1 point. Operation at L-1 affords the possibility of making simultaneous whole disk measurements, which is a new vantage point for Earth radiation budget measurements. This presentation will review the design and characterization of the Scripps-NISTAR instrument.

Keywords: Infrared, thermal, radiation, L-1, radiometer, cavity